

U.S. Serial No.: 10/054,228
Reply to Office Action of: 01/06/2004
Family No.: P2001J067

2

Remarks

Before addressing the patentability of the claims at issue, applicants wish to acknowledge and to thank the Examiner for renumbering the misnumbered claims submitted in their amendment filed on November 17, 2003.

Turning now to the patentability of the claims at issue, applicants believe it is important to first focus on the distinction between several terms used in the art cited by the Examiner and terms used in the claims at issue.

Applicants invention is directed toward activating a regenerated but not reactivated cobalt catalyst. As is well known in the art, an HCS catalyst that is irreversibly deactivated may be regenerated by exposing the catalyst to an oxygen atmosphere at elevated temperatures. This is done in a regeneration vessel and not in the HCS reactor. After regeneration the catalyst then needs to be activated which in the prior art is also done in a reactor other than the HCS reactor. Applicants have discovered that a regenerated but not reactivated catalyst may be activated by introducing the regenerated catalyst into a slurry HCS reactor operating under HCS process conditions and containing catalyst rejuvenation means.

Rejuvenation is a process that is distinct from regeneration. Rejuvenation is applicable to reversibly deactivated catalysts. In the case of rejuvenation the catalyst is not subjected to an oxidation step. Rather the reversibly deactivated catalyst is subjected to a hydrogen treatment.

The Examiner has rejected claims 1 to 3 and 9 under 35 USC 102(b) as anticipated by Pedrick. Applicants respectfully traverse that rejection.

U.S. Serial No.: 10/054,228
Reply to Office Action of: 01/06/2004
Family No.: P2001J067

3

Pedrick discloses rejuvenating a reversibly deactivated catalyst by treating the catalyst with hydrogen in a slurry phase reactor. As explained above, rejuvenation is not equivalent to activation of a regenerated catalyst. Thus, Pedrick clearly fails to anticipate the claimed invention.

The Examiner has rejected claims 4, 10 to 13 and 18 to 20, and 21 and 26 to 30 under 35 USC 103(a) based on various combinations of references. Before addressing each of the specific combination of references, applicants contend that their claimed invention is totally unobvious and unexpected for the following reasons.

First, all the art cited by the Examiner supports applicants' position that only reversibly deactivated catalysts can be rejuvenated, i.e., reactivated without regeneration.

Second, applicants demonstrated in the instant application that freshly prepared catalyst has to be reduced ex situ the HCS reactor to become fully activated.

Therefore, there is absolutely no reason why a person with ordinary skill in the art would expect that a regenerated catalyst could be activated in an HCS slurry reactor having catalyst rejuvenation means and operating under HCS process conditions.

The Examiner rejected claim 4 under 35 USC 103(a) based on Pedrick in view of Bauman. Each of these references, however, relates to rejuvenating a reversibly deactivated catalyst. Pedrick discloses injecting a hydrogen containing gas into the draft tube of an HCS slurry reactor. Bauman discloses removing water and liquid hydrocarbons from an HCS reactor tail gas and using the resulting stream in rejuvenating a reversibly deactivated catalyst. Neither teach anything with respect to

U.S. Serial No.: 10/054,228
Reply to Office Action of: 01/06/2004
Family No.: P2001J067

4

activating an irreversibly deactivated catalyst that has been regenerated but requires activation. Clearly they fail to render claim 4 obvious.

The Examiner rejected claims 10 to 13 and 18 to 20 under 35 USC 103(b) based on Pedrick in view of Hsia. As with the preceding rejection these references deal with rejuvenation of reversibly deactivated catalysts and not activation of a regenerated catalyst. Indeed, because the combined references fail to remotely disclose or suggest the activation process of claim 1, they fail to render claims 10 to 13 and 18 to 20 obvious.

The Examiner rejected claims 21 and 26 to 30 under 35 USC 103(a) based on Pedrick in view of Hsia and Bauman. As with the prior rejection under 35 USC 103(a) this combination of references fails to render applications claimed invention obvious.

The crux of all three references is that they deal with rejuvenation of reversibly deactivated catalyst, not irreversibly deactivated catalyst that has been regenerated.

Applicants' claimed 21 to 30 process requires among other things removing long term deactivated catalyst from the HCS reactor to a regeneration vessel. The catalyst there is regenerated but not reactivated. Then the regenerated catalyst is returned to the HCS vessel where it is reactivated at HCS process conditions.

Pedrick rejuvenates a catalyst in a slurry reactor having draft tubes. No catalyst is removed or regenerated.

U.S. Serial No.: 10/054,228
Reply to Office Action of: 01/06/2004
Family No.: P2001J067

5

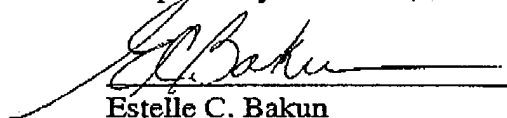
Hsia uses first and second slurry reactors. Reversibly deactivated catalyst from the first is removed, not to a regeneration vessel, but to a second slurry HCS reactor having rejuvenation means. Here the catalyst is rejuvenated.

Bauman uses first and second slurry reactors. Unlike Hsia Bauman's first reactor has rejuvenation means while Bauman's second does not. Bauman uses a process tail gas from which water and liquid hydrocarbons have been removed for rejuvenating, not activating a regenerated catalyst. In the case of Bauman this tail gas is used in the first reactor.

Clearly none of the references alone or in combination disclose or suggest removing irreversibly deactivated catalyst from an HCS slurry reactor, regenerating the removed catalyst in a regeneration vessel and thereafter activating that regenerated catalyst in the HCS reactor under HCS process conditions.

In view of the foregoing comments applicants submit the subject claims are patentable and they request that the Examiner withdraw his rejection and pass the case to issue.

Respectfully submitted,



Estelle C. Bakun

Attorney for Applicant(s)

Registration No. 35,054

Telephone Number: (908) 730-3635

Facsimile Number: (908) 730-3649

☒ Pursuant to 37 CFR 1.34(a)

ExxonMobil Research and Engineering Company
P. O. Box 900
Annandale, New Jersey 08801-0900

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